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ABSTRACT

A cumulative, multi-item measure of interorganizational relations (IOR) was used to assess the generalizability of IOR measures across organizational hierarchical levels. An 8-item scale, from low to high intensity, was developed theoretically and empirically. Items were administered 2,700 times to state, district, and county hierarchical levels of 156 health related organizational units. Guttman analysis evaluated the empirical fit of data to the theoretical model. Comparative frameworks were an original theoretical ordering, empirical orderings, and 3 alternative theoretical orderings. Using the coefficient of reproducibility, valid scales were theoretical ordering, empirical ordering, and all alternative theoretical orderings for district and county levels. For the coefficient of scalibility, valid scales were: theoretical ordering for district level; empirical ordering for state and district levels; first alternative theoretical ordering for state level; and second alternative theoretical ordering for district level. Inconsistencies in valid scales among organizational hierarchical levels indicated that hierarchical level may be a moderator for IOR; level influences theoretical, methodological, and applied developments in IOR. (Author/NQ)

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INTERORGANIZATIONAL MEASUREMENT: DIFFERENCES BETWEEN HIERARCHICAL LEVELS OF ORGANIZATIONS

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ABSTRACT

Interorganizational relations usually have been measured by a single indicator, rather than a composite measure. Our purpose was to use a cumulative, multi-item measure of interorganizational relations to assess the generalizability of IOR measures across organizational hierarchical levels. An eight-item scale, ordered from low to high intensity of IOR, was developed theoretically and empirically. Twenty-seven hundred administrations of the items, among state, district, and county hierarchical levels of 156 health related organizational units, were studied. Guttman analysis was used to evaluate the empirical fit of data to the theoretical model. Three comparative frameworks were used: (1) an original theoretical ordering; (2) empirical orderings developed for each hierarchical level; and (3) three alternative theoretical orderings based on the best empirical ordering for each hierarchical level. When we used the primary criterion of coefficient of reproducibility, the scales were valid for the: (1) theoretical ordering - district and county levels; (2) empirical ordering - district and county levels; (3) all alternative theoretical orderings - district and county levels. When we used the criterion of coefficient of scalibility, the valid scales were: (1) theoretical ordering - district level; (2) empirical ordering - state and district levels; (3) first alternative theoretical ordering - state level; (4) second alternative theoretical ordering - district level. Inconsistencies in valid scales among organizational hierarchical levels indicated that hierarchical level may be a moderator for interorganizational relations; level influences theoretical, methodological, and applied developments in IOR.

INTERORGANIZATIONAL MEASUREMENT: DIFFERENCES BETWEEN HIERARCHICAL LEVELS OF ORGANIZATIONS

INTRODUCTION

Past measurement of interorganizational relations (IOR) has often neglected the cumulative nature of interorganizational involvement. That is, the assumption has sometimes been theoretically operative, but not present in most IOR measures, that activities such as written agreements between organizations indicate a more intense IOR commitment than do such activities as interaction of organizational directors. Aiken and Hage (1968) used a single indicator to measure only a higher level of IOR involvement in counting the number of joint programs carried out between two organizations. Levine and White (1961) used a series of indicators of IOR without developing a composite measure.

Finley's (1969) study is one of the two studies of which we are cognizant that develop cumulative multiple-indicator measures of IOR. Klonglan et al. (1972) combine assumptions about the developmental idea of IOR with multiple-indicator measures of the concept. The Klonglan et al. (1972) empirical analysis combined three hierarchical levels (state, district, and county) of the same organizations. Given the infancy of the developmental assumption and of the use of multiple-indicators in IOR measurement, it seems that we should consider moderating effects (Ghiselli, 1963), such as organizational level, on IOR theory and measurement. Our general objective is to assess the generalizability of the measurement of interorganizational relations across hierarchical levels of organizations.

FORMS OF INTERORGANIZATIONAL RELATIONS

Interorganizational relations, as defined in this paper, are the contacts occurring between members of an organization's task environment. Task environment, as conceptualized by Dill (1958), denotes the parts of the environment presently or potentially relevant to goal setting and attainment. Our usage of IOR is restricted to cooperative forms and does not include competitive or conflicting interorganizational relations (Thompson and McEwen, 1958).

Eight IOR Forms

Using ideas suggested by Thompson and McEwen (1958), Litwak and Hylton (1962), and Finley (1969), Klonglan, et al., (1972) developed eight items to operationalize forms of interorganizational relations. These items are measures of organizational interaction which occurs in the process of developing interorganizational relations. Each item is measured by asking one organization about its interaction with a second organization. The eight items are listed in the theoretical ordering used by Klonglan et al. (1972) to indicate IOR forms from low to high intensity. The rationale for this ordering follows the listing.

The first three forms represent Litwak and Hylton's (1962) awareness of interdependence:

(1) Director awareness of the existence of another organization;

(2) Director acquaintance between organizations;

(3) Director interaction between organizations;

The fourth item is a low level of resource exchange from Finley (1969):

(4) Information exchange of newsletters, reports, and releases;

Forms five through seven are from Thompson and McEwen (1958):

(5) Resource exchange (bargaining) of funds, materials, or personnel;

(6) Overlapping board membership (co-optation) of staff or members;

(7) Joint programs (coalition) to plan and implement activities;

The final item represents the standardized action of Litwak and Hylton (1962):

(8) Written agreements to share activities between organizations.

Ordering Rationale

The first item or form specifies that the director is only aware of the existence of another organization. The next two forms represent a "feeling out" of the situation by the organization. It is assumed that initial contact is conducted by the principal administrator or "director." Often this relatively low level of relations is sufficient to obtain needed resources or goals. If it is not, the fourth level involves information exchange. The fifth form, resource exchange, represents further commitment to other organizations in terms of funds, materials, or personnel skills. The sixth level, overlapping board membership, involves absorption of leaders of one or more organizations into the power structure of a focal organization. This assists the organization in operating and legitimizing its domain. An organization still seeking resources may establish joint programs, the seventh form, that insure commitments from other organizations. The eighth and final step is to formalize commitments between organizations through written agreements. At this step, the organization is totally committed to the interorganizational activity and has high predictability of resources from the task environment.

These eight items are intended to measure the intensity of cooperative interorganizational relations. Intensity is an ordinal continuum of forms for resource attainment that represents increasing involvement with organizations in the task environment. For example, if an organizations' highest intensity of

involvement was information exchange, we assume that the director was aware of the existence of the other organization and the directors of each organization were acquainted and had interacted. The potential for intensity of interorganizational relations may differ between hierarchical levels of organizations.

IMPORTANCE OF HIERARCHICAL LEVEL

Hierarchical level is defined in this article as state, district, and county units of an organization. This definition is different from the usual definition of hierarchical level as authority level within an organization; i.e., president, vice-president, etc. In a review of literature in the area of interorganizational relations, we did not find studies of hierarchical level as we have defined it. General organizational studies and some IOR literature, however, provide a logical rationale for pursuing the importance of hierarchical level as we define it in terms of different levels of organizational units.

General Organizational Research

Many organizational studies have focused on only one hierarchical level of organizational units. For example, Aiken and Hage (1968), Hasenfeld (1971), Milio (1971), and Zald (1967) studied organizational units only at local community levels. Other studies have focused on variables such as size or goal-displacement and have not assessed the influence of hierarchical level, even though the analysis encompassed two or more different hierarchical levels of organizations (Blau, 1970; Meyer, 1972; Mulford and Klonglan, 1970).

Turk's (1970:15-16) comparative study of interorganizational systems supports "that both the inter-organizational links that tie the city to its socio-cultural environment, as well as those which connect its internal elements, provide latent or active structures which may be used or modified for new purposes, provide points of articulation, or at the very least serve as models for new inter-organizational systems." By implication from Turk, the propensity for certain activities, such as interorganizational relations, may differ between hierarchical levels.

Structural variation in organizations may connote differing goals and normative behavior that may affect the intensity of IOR (Bridges et al., 1968; Litwak, 1967; Hall, 1962). For example, in a more homogeneous county unit of a health organization, the unofficial structure may allow directors to exchange resources informally whereas the more heterogeneous, formalized state level structure of the same organization may require formalized agreements before the same kind of resources may be exchanged.

Possible Differences

Among the differences that may exist between hierarchical levels are available resources for exchange. State levels may have more or fewer resources, such as personnel, to exchange, depending upon methods of collection and distribution of finances for salaries. Because of the greater resources the state level may control, the propensity for IOR may be low since a state level organization may not need resources from other organizations to help meet its goals. A county level, however, might need to pursue IOR to obtain needed resources.

Types of information available for exchange and methods of exchange might also differ among levels. State levels often have regular newsletters with

wide distributions. In contrast, county levels may be financially limited to less formal, more personal information and methods of exchange.

Organizational policy may only allow state levels to make written commitments. If this were true for an organization, the intensity for IOR by county and district units would be limited. On the other hand, organizational goals may allow for cooperative interorganizational relations at the county level to directly influence the target audience; state level goals may be more concerned with establishing organizational policy and may show little interest in working with other organizations.

Given these reasons for the potential importance of hierarchical level, we are concerned with three specific objectives: (1) to determine if the theoretical ordering of IOR holds for differing hierarchical levels of organizations; (2) to determine the best empirical ordering for each hierarchical level of organizational units; and (3) to evaluate alternative theoretical models developed from the best empirical orderings for each organizational hierarchical level.

MEASUREMENT OF INTERORGANIZATIONAL RELATIONS

One hundred and fifty-six state, district, and county levels of 35 health related organizations in a non-metropolitan state were studied in 1969. Respondents, the "top" paid administrators at the specific organizational level, were asked to respond in terms of the 18 contact organizations in their task environment in their geographical area. The eight item scale was administered 2808 times (156 X 18); the usable observations after deleting those where the respondent's organization was also a contact organization, was 2700. The total administrations at the state level were 631; 771 at the district

level; and 1298 at the county level.

Measurement Items

Each of the items in the IOR scale was answered, "Yes" or "No." The specific questions for each item are:

1. Director awareness:

   As far as you know, is there (name of other organization) in this (state, area, or county)?

2. Director acquaintance:

   Are you acquainted with the director or person in charge of (contact organization)?

3. Director interaction:

   Have you met with the director of (contact organization) at any time during the past year to discuss the activities of your respective organizations?

4. Information exchange:

   Is your organization on (contact organization's) mailing list to receive newsletters, annual reports, or other information? OR: Is (contact organization) on your organization's mailing list to receive any of your newsletters, annual reports, or other information releases?

5. Resource exchange (bargaining):

   Has your organization shared, loaned, or provided resources such as meeting rooms, personnel, equipment, or funds to (contact organization) at any time during the last three years? OR: Has (contact organization) shared, loaned, or provided resources such as meeting rooms, personnel, equipment, or funds to your organization at any time during the last three years?

6. Overlapping boards or councils (co-optation):

   Does anyone from your organization or (contact organization) including staff, board members, or members serve on boards, councils, or committees of the other organization?

7. Joint programs (coalition):

   Within the last three years, has your organization worked jointly in planning and implementing any specific programs or activities with (contact organization)?

8. Written agreements:

   Does your organization have any written agreements with (contact organization) pertaining to personnel commitments, client referrals, procedures for working together, or other joint activities?

EVALUATION OF THE IOR MEASURE

The cumulative measure of interorganizational relations will be evaluated in three ways. First, we will compare the three hierarchical levels of state, district, and county on the theoretical IOR ordering of items. Second, we will determine the best empirical ordering for each hierarchical level and compare any differences between each empirical ordering to the original theoretical IOR ordering. Third, we will determine how the other two hierarchical levels fit to the best empirical ordering for each of the three hierarchical levels.

Data on response patterns and scale types will be presented as a preliminary basis for evaluation of the IOR measure. If differences exist between hierarchical levels on "Yes" response patterns and conforming scale types, we will have established an intuitive rationale for further analysis to more precisely determine the influence of hierarchical level on interorganizational relations measurement.

Item Differences

Table 1 presents the frequency of "Yes" responses to each of the eight

(Table 1 about here)

scale items. Examination of precentage responses, between state, district, and county levels, indicates there are differences between the three levels on the frequency of "Yes" responses to each item.

"Perfect" Scale Types

Frequencies of perfect scale patterns indicate that 2025, or 75 percent, of the usable administrations (N=2700) conformed to one of the nine perfect

(Table 2 about here)

cumulative patterns. The exact forms of IOR were predicted from a summary score three-fourths of the time for the total administrations. The percentages of conforming patterns, however, differed across levels: state = 58.3%, district = 83.5%, and county = 78.1%. This suggests that the theoretical model of the intensity of IOR is most applicable to the district level and least supported at the state level. Note that nearly half of the district (46.3%) and county (41.8%) levels have no IOR, however, a low percentage of state level units (13.0%) had no IOR involvement. This suggests that the evaluation of the theoretical model may be influenced by the lack of interorganizational relations. Our purpose is to test IOR differences between hierarchical levels; future analysis might consider the validity of our theoretical model under the assumption that all organizations studied participated in IOR.

Theoretical Ordering

We will use four statistics in the evaluation of the cumulative scales (Guttman, 1947; Edwards, 1957; Riley et al., 1954; Nie et al., 1970): (1) the

coefficient of reproducibility reflects the extent to which a respondent's scale score predicts his response pattern; (2) the minimum marginal reproducibility constitutes the minimal coefficient of reproducibility that could have occurred for a given scale; (3) percentage improvement, the difference between the coefficient of reproducibility and the minimum marginal reproducibility, indicates the extent to which the coefficient of reproducibility is due to response patterns; (4) coefficient of scalibility, computed by dividing the percentage improvement by the difference between the minimum marginal reproducibility and one, reflects the largest value possible for the percentage improvement.[1]

The coefficient of reproducibility for the theoretical ordering is .8752

(Table 3 about here)

for the state level; .9491 at the district level; and .9312 at the county level. Only at two of the levels is the coefficient above the norm of .9 for a valid scale. The minimum marginal reproducibility, .7019, .8719, and .8499 for the state, district, and county levels, respectively, compared with the coefficient of reproducibility, indicates the IOR measure is more cumulative (percentage improvement of .1733, .0772, .0814 for the state, district, and county, respectively) than chance alone would dictate. The coefficient of scalibility, state = .5814; district = .6025; and county = .5420, meets the norm of .6 at only the district level. Overall, only at the district level are the criteria for coefficient of reproducibility and coefficient of scalibility met. Statistics for the state level met neither of these criteria. For the county level, the minimum for the coefficient of reproducibility was met, but the minimum for the coefficient of scalibility was not met.

The statistical analysis indicates some support for the theoretical ordering of the IOR items. These findings lead us to hypothesize that an

empirical determination of ordering might provide an alternative IOR ordering that is statistically more significant as well as theoretically plausible.

Empirical Ordering

Empirical orderings, using frequencies of positive responses, were developed for each hierarchical level. A completely empirical determination provides the best statistical evaluation criteria. Thus, as expected, the statistical criteria for the empirical orderings are better (higher) than the statistical criteria using the theoretical ordering. (See Table 3.)

When the empirical evaluations are compared across hierarchical levels, we see some major differences in the ordering of IOR items. None of the empi-

(Table 4 about here)

rical orders were totally homogeneous with the theoretical order. The place-

(Table 5 about here)

ment of director awareness, director acquaintance, and written agreements, however, did not fluctuate between the theoretical and empirical orderings. Director interaction is ordered third theoretically, but is fourth empirically for each hierarchical level. This suggests that interaction between directors involves more intense interorganizational relations than postulated. Information exchange is ranked fourth theoretically, but is empirically found to be third at the state level, and fifth at the district and county levels. As one possible explanation for this different order, the kinds of information exchanged may differ between levels. For example, the state may exchange generalized, easily collected information, but the district and county levels may have devoted greater resources to initial collection and assemblage of information and be less willing to share the information. Resource exchange changes from fifth place theoretically to sixth at the state and district

levels, but third at the county level. County level organizations may be forced, possibly because of more limited resources than state and district levels, to exchange resources to fulfill organizational goals. Overlapping boards, sixth theorretically, is a more intense form of IOR interaction, a consistent rank of seventh empirically, than the theoretical ordering had assumed. Joint programs, however, are indicative of less intense IOR than the theoretical ordering allowed.

Across the three empirical models, five items retained the same order: (1) director awareness - first; (2) director acquaintance - second; (3) director interaction - fourth; (4) overlapping boards - seventh; and (5) written agreements - eighth. To construct theories from the empirical world, the consistency of the order of these items suggests these orders for the five items might be pursued. The other three items, information exchange, resource exchange, and joint programs, may be ordered differently between organizational levels because of true differences between levels in the intensity of IOR indicated by each.

Comparison statistics for the theoretical and empirical orders are presented in Table 3. For each level, the coefficient of reproducibility and the coefficient of scalibility were increased in the empirical ordering over the theoretical ordering. By using only the primary criterion of coefficient of reproducibility (Torgerson, 1958), the theoretical and the empirical ordered models are valid only for the district and county levels, not for the state level.

Alternative Theoretical Orderings

Statistical differences, as well as differing orders between the theoretical and empirical models, imply the theoretical model should be re-evaluated

to determine if alternative assumptions about intensity of IOR would align a theoretical model more closely to the empirical data. Thus, we developed three alternative theoretical orderings based upon the empirical ordering for each hierarchical level. The first alternative theoretical ordering is based on the state empirical model; the second alternative theoretical ordering is based on the district empirical ordering; the third alternative theoretical ordering is based on the county empirical ordering. Differences in ordering of items between the original theoretical ordering and each alternative theoretical ordering are specified in Tables 6, 7, and 8.

(Tables 6, 7, and 8 about here)

Statistical comparisons indicate inconsistent improvement of the alternative theoretical orderings over the original theoretical order. Examining the coefficients of reproducibility, the district and county levels consistently

(Table 9 about here)

meet the minimum criteria of .9. In none of the theoretical orderings is the coefficient of reproducibility .9 or above for the state hierarchical level. The district level meets the minimal criteria of .6 for the coefficient of scalibility in the original theoretical ordering and in the second alternative theoretical ordering. The state level meets the .6 coefficient of scalibility criteria in the first alternative theoretical ordering. These differences support the hypothesized moderating effect of organizational hierarchical level. Only about half, however, of the district and county levels experienced IOR. The state level has had more interorganizational relations and, by its bureaucratic nature, would seem to continue to be the unit most potentially involved in IOR. For example, state memos to district and county offices are indicative of IOR. Probably fewer memos, however, are sent from the district or county levels to the state level.

Although the findings indicate some support for the original theoretical model, the alternative theoretical models, which were empirically derived, indicate that future analysis should rigorously evaluate the theoretical implications of empirical orderings of IOR items. Research in several empirical arenas is needed to determine if support for the theoretical or empirical orderings differs between alternative hierarchical levels of organizations.

IMPLICATIONS FOR INTERORGANIZATIONAL RELATIONS

The IOR multi-item measure allows examination of alternative forms of organizational interaction. Theory construction and testing can be enhanced through measures of intersity of relationships between organizations.

Our major purpose was to assess the generalizability of the measurement of IOR across organizational levels. Although some measures of IOR, such as director awareness, acquaintance, and interaction, overlapping boards, and written agreements, are consistently ordered empirically across organizational hierarchical levels, other measures such as information and resource exchange and joint programs differed in order between levels of organizations. Thus, researchers and practitioners should be cognizant of the limited generalizability of interorganizational relations measures between organizational levels. To the theorist, this conclusion necessitates reformulation of general IOR theory to allow for the moderating effect of hierarchical level. To the methodologist, the conclusion suggests alternative measurement models may be required for differing levels of an organization. To the applied scientist and social planner, working with differing organizational levels requires understanding the particular forms of interorganizational relations indicative of more and

less intense organizational interaction. For example, a county level organization perceiving joint programs as a high intensity of IOR might be more difficult to involve in joint programs than a district level organization that perceived joint programs as being of low IOR intensity. Measurement of inter-organizational relations allows for the assessment of the potential by a specific hierarchical organizational unit to engage in IOR. Etzioni's (1961:xiii) statement, in discussing the bureaucratic model, is also applicable to using an IOR measurement model that does not allow for differing hierarchical levels of organizations: "Policy recommendations based on such a 'universal' model can lead to ill-advised action."

FOOTNOTE

1. All statistics were computed utilizing SPSS procedures, (Nie, et al., 1970).

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TABLE 1. FREQUENCY OF "YES" RESPONSES

	Frequency of "Yes" Responses					
	State		District		County	
SCALE ITEMS	N	% of 631	N	% of 771	N	% of 1298
1. Director Awareness	549	87.0	414	53.7	756	58.2
2. Director Acquaintance	320	50.7	125	16.2	316	24.3
3. Director Interaction	243	38.5	67	8.7	148	11.4
4. Information Exchange	295	46.8	64	8.3	140	10.8
5. Resource Exchange	196	31.1	60	7.8	152	11.7
6. Overlapping Boards	115	18.2	36	4.7	114	8.8
7. Joint Programs	231	36.6	73	9.5	138	10.6
8. Written Agreements	32	5.1	8	1.0	9	0.7

TABLE 2. FREQUENCIES OF "PERFECT" SCALE PATTERNS

Scale Type (Pattern)	SCALE ITEMS								Frequency of Scale Type					
	1 Director Awareness	2 Director Acquaintance	3 Director Interaction	4 Information Exchange	5 Resource Exchange	6 Overlapping Boards	7 Joint Programs	8 Written Agreements	State N	State % of 631	District N	District % of 771	County N	County % of 1298
	Y*	Y	Y	Y	Y	Y	Y	Y	8	1.3	0	0.0	1	.1
	Y	Y	Y	Y	Y	Y	Y	N	38	6.0	6	.8	5	.4
	Y	Y	Y	Y	Y	Y	N	N	13	2.1	2	.3	4	.3
	Y	Y	Y	Y	Y	N	N	N	11	1.7	2	.3	6	.5
	Y	Y	Y	Y	N	N	N	N	32	5.1	8	1.0	11	.8
	Y	Y	Y	N	N	N	N	N	19	3.0	15	1.9	23	1.8
	Y	Y	N	N	N	N	N	N	19	3.0	35	4.5	100	7.7
	Y	N	N	N	N	N	N	N	146	23.1	219	28.4	321	24.7
	N	N	N	N	N	N	N	N	82	13.0	357	46.3	542	41.8
	TOTAL DETERMINISTIC (CONFORMING) ADMINISTRATORS								368	58.3	644	83.5	1013	78.1

* Y = "Yes," organization does have this type of relation with the "contact" organization.
N = "No," organization does not have this type of relation with the "contact" organization.

BLE 2. FREQUENCIES OF "PERFECT" SCALE PATTERNS

TEMS				Frequency of Scale Type							
5 Resource Exchange	6 Overlapping Boards	7 Joint Programs	8 Written Agreements	State N	State % of 631	District N	District % of 771	County N	County % of 1298	Total N	Total % of 2700
Y	Y	Y	Y	8	1.3	0	0.0	1	.1	9	.3
Y	Y	Y	N	38	6.0	6	.8	5	.4	49	1.8
Y	Y	N	N	13	2.1	2	.3	4	.3	19	.7
Y	N	N	N	11	1.7	2	.3	6	.5	19	.7
N	N	N	N	32	5.1	8	1.0	11	.8	51	1.9
N	N	N	N	19	3.0	15	1.9	23	1.8	57	2.1
N	N	N	N	19	3.0	35	4.5	100	7.7	154	5.7
N	N	N	N	146	23.1	219	28.4	321	24.7	686	25.4
N	N	N	N	82	13.0	357	46.3	542	41.8	981	36.3
(CONFORMING) ADMINISTRATORS				368	58.3	644	83.5	1013	78.1	2025	75.0

s type of relation with the "contact" organization.

this type of relation with the "contact" organization.

TABLE 3. COMPARISON OF THEORETICAL AND EMPIRICAL ORDERING

COMPARISON STATISTICS	THEORETICAL ORDERING			EMPIRICAL ORDERING			DIFFERENCES (Theoretical-Empirical)		
	State	District	County	State	District	County	State	District	County
A. Coefficient of reproducibility	.8752	.9491	.9312	.8966	.9501	.9347	-.0214	-.0189	-.0035
B. Minimum marginal reproducibility	.7019	.8719	.8499	.7019	.8719	.8499	------	------	------
C. Percent improvement	.1733	.0772	.0814	.1947	.0781	.0848	-.0214	-.0009	-.0034
D. Coefficient of scalability	.5814	.6025	.5420	.6532	.6101	.5651	-.0718	-.0076	-.0231

TABLE 4. COMPARISON OF DIFFERENCES BETWEEN THEORETICAL AND EMPIRICAL ORDERINGS

ORDERINGS COMPARED	STATISTICS
1. Theoretical - State* District - County	.89†
2. Theoretical - State	.90‡
3. Theoretical - District	.76
4. Theoretical - County	.90
5. State - District	.90
6. State - County	.83
7. District - County	.79

* State, District, and County refer to the empirical orderings for each level.

† Differences among four rankings measured by Kendall's Coefficient of concordance (Siegel, 1956) and tested by chi-square analysis. Calculated $X^2 = 21.36$. Tabular X^2, 3 df, .05 = 7.82.

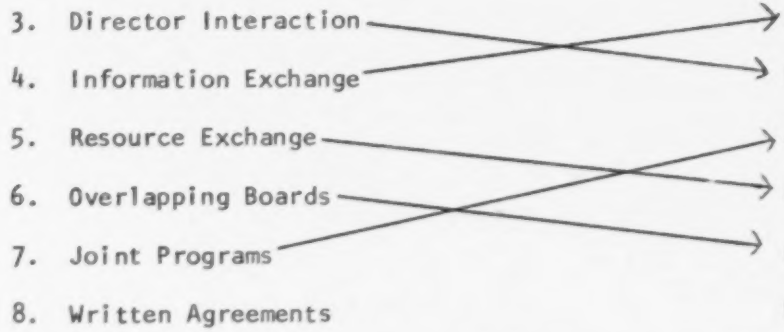
‡ Differences in orderings 2 - 7 tested by Spearman's rank order correlation coefficient (Siegel (1956). Tabular r_s, 8 df, .05 = .643.

TABLE 5. THEORETICAL AND EMPIRICAL ITEM ORDERING

THEORETICAL ORDERING	EMPIRICAL ORDERING		
	State	District	County
1. Director Awareness	Director Awareness	Director Awareness	Director Awareness
2. Director Acquaintance	Director Acquaintance	Director Acquaintance	Director Acquaintance
3. Director Interaction	Information Exchange	Joint Programs	Resource Exchange
4. Information Exchange	Director Interaction	Director Interaction	Director Interaction
5. Resource Exchange	Joint Programs	Information Exchange	Information Exchange
6. Overlapping Boards	Resource Exchange	Resource Exchange	Joint Programs
7. Joint Programs	Overlapping Boards	Overlapping Boards	Overlapping Boards
8. Written Agreements	Written Agreements	Written Agreements	Written Agreements

TABLE 6. ORIGINAL AND FIRST ALTERNATIVE THEORETICAL ORDERING*

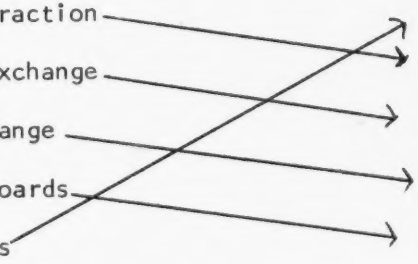
ORIGINAL THEORETICAL ORDERING	FIRST ALTERNATIVE THEORETICAL ORDERING
1. Director Awareness	Director Awareness
2. Director Acquaintance	Director Acquaintance
3. Director Interaction	Information Exchange
4. Information Exchange	Director Interaction
5. Resource Exchange	Joint Programs
6. Overlapping Boards	Resource Exchange
7. Joint Programs	Overlapping Boards
8. Written Agreements	Written Agreements



* First alternative theoretical ordering based on empirical ordering for state level.

TABLE 7. ORIGINAL AND SECOND ALTERNATIVE THEORETICAL ORDERING*

ORIGINAL THEORETICAL ORDERING	SECOND ALTERNATIVE THEORETICAL ORDERING
1. Director Awareness	Director Awareness
2. Director Acquaintance	Director Acquaintance
3. Director Interaction	Joint Programs
4. Information Exchange	Director Interaction
5. Resource Exchange	Information Exchange
6. Overlapping Boards	Resource Exchange
7. Joint Programs	Overlapping Boards
8. Written Agreements	Written Agreements



* Second alternative theoretical ordering based on empirical ordering for district level.

TABLE 8. ORIGINAL AND THIRD ALTERNATIVE THEORETICAL ORDERING*

ORIGINAL THEORETICAL ORDERING	THIRD ALTERNATIVE THEORETICAL ORDERING
1. Director Awareness	Director Awareness
2. Director Acquaintance	Director Acquaintance
3. Director Interaction	Resource Exchange
4. Information Exchange	Director Interaction
5. Resource Exchange	Information Exchange
6. Overlapping Boards	Joint Programs
7. Joint Programs	Overlapping Boards
8. Written Agreements	Written Agreements

* Third alternative theoretical ordering based on empirical ordering for county level.

TABLE 9. COMPARISON OF ORIGINAL AND ALTERNATIVE THEORETICAL ORDERINGS

COMPARISON STATISTICS	ORIGINAL THEORETICAL ORDERING			FIRST ALTERNATIVE THEORETICAL ORDERING *			SECOND ALTERNATIVE THEORETICAL ORDERING †			THI THEO
	State	District	County	State	District	County	State	District	County	State
A. Coefficient of reproducibility	.8752	.9491	.9312	.8966	.9471	.9364	.8780	.9501	.9318	.8669
B. Minimum marginal reproducibility	.7019	.8719	.8499	.7019	.8719	.8499	.7019	.8719	.8499	.7019
C. Percent improvement	.1733	.0772	.0814	.1947	.0752	.0866	.1761	.0781	.0820	.1650
D. Coefficient of scalability	.5814	.6025	.5420	.6532	.5873	.5767	.5907	.6101	.5459	.5535

* First alternative theoretical ordering based on empirical ordering for state level.

† Second alternative theoretical ordering based on empirical ordering for district level.

‡ Third alternative theoretical ordering based on empirical ordering for county level.

TABLE 9. COMPARISON OF ORIGINAL AND ALTERNATIVE THEORETICAL ORDERINGS

ORIGINAL THEORETICAL ORDERING			FIRST ALTERNATIVE THEORETICAL ORDERING *			SECOND ALTERNATIVE THEORETICAL ORDERING †			THIRD ALTERNATIVE THEORETICAL ORDERING ‡		
State	District	County	State	District	County	State	District	County	State	District	County
.8752	.9491	.9312	.8966	.9471	.9364	.8780	.9501	.9318	.8669	.9481	.9347
.7019	.8719	.8499	.7019	.8719	.8499	.7019	.8719	.8499	.7019	.8719	.8499
.1733	.0772	.0814	.1947	.0752	.0866	.1761	.0781	.0820	.1650	.0762	.0848
.5814	.6025	.5420	.6532	.5873	.5767	.5907	.6101	.5459	.5535	.5949	.5651

dering based on empirical ordering for state level.

rdering based on empirical ordering for district level.

dering based on empirical ordering for county level.

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INTER-ORGANIZATIONAL MEASUREMENT: DIFFERENCES BETWEEN HIERARCHICAL LEVELS OF ORGANIZATIONS

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INTRODUCTION

1. In past measurement of inter-organizational relations, there has been a lack of multi-item measures of intensity of interaction (Aiken and Hage, Levine and White).

2. Finley and Klonglan, et al., developed cumulative multiple-indicator measures of IOR; Klonglan's analysis included three hierarchical levels (state, district, and county).

GENERAL PURPOSE

To assess the generalizability of the measurement of inter-organizational relations across organizational levels.

IMPORTANT DEFINITIONS

Inter-organizational relations (IOR):

Contacts occurring among members of an organization's task environment (Dill)

Hierarchical level:

Differing levels of organizational units (i.e., state, district and county)

EIGHT FORMS OF INTER-ORGANIZATIONAL RELATIONS

1) DIRECTOR AWARENESS OF THE EXISTENCE OF ANOTHER ORGANIZATION
2) DIRECTOR ACQUAINTANCE BETWEEN ORGANIZATIONS
3) DIRECTOR INTERACTION BETWEEN ORGANIZATIONS

} LITWAK & HYLTON

4) INFORMATION EXCHANGE OF NEWSLETTERS, REPORTS, AND RELEASES } FINLEY

5) RESOURCE EXCHANGE (BARGAINING) OF FUNDS, MATERIALS, OR PERSONNEL
6) OVERLAPPING BOARD MEMBERSHIP (CO-OPTATION) THROUGH SHARING STAFF OR MEMBERS
7) JOINT PROGRAMS (COALITION) TO PLAN AND IMPLEMENT ACTIVITIES

} THOMPSON & MCEWEN

8) WRITTEN AGREEMENTS TO SHARE ACTIVITIES BETWEEN ORGANIZATIONS } LITWAK & HYLTON

MEASUREMENT OF INTER-ORGANIZATIONAL RELATIONS

1. AWARENESS:

   As far as you know is there (name of other organization) in this (state, district, or county)?

2. ACQUAINTANCE:

   Are you acquainted with the director or person in charge of (contact organization)?

3. INTERACTION:

   Have you met with the director of (contact organization) any time during the past year to discuss the activities of your respective organizations?

4. INFORMATION EXCHANGE:

   Is your organization on (contact organization's) mailing list to receive newsletters, annual reports or other information: OR: Is (contact organization) on your organization's mailing list to receive any of your newsletters, annual reports or other information releases?

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MEASUREMENT OF INTER-ORGANIZATIONAL RELATIONS (CONT'D)

5. RESOURCE EXCHANGE (BARGAINING):

HAS YOUR ORGANIZATION SHARED, LOANED, OR PROVIDED RESOURCES SUCH AS MEETING ROOMS, PERSONNEL, EQUIPMENT OR FUNDS TO (CONTACT ORGANIZATION) AT ANY TIME DURING THE LAST THREE YEARS? OR: HAS (CONTACT ORGANIZATION) SHARED, LOANED OR PROVIDED RESOURCES SUCH AS MEETING ROOMS, PERSONNEL, EQUIPMENT OR FUNDS TO YOUR ORGANIZATION AT ANY TIME DURING THE LAST THREE YEARS?

6. OVERLAPPING BOARDS OR COUNCILS (CO-OPTATION):

DOES ANYONE FROM YOUR ORGANIZATION OR (CONTACT ORGANIZATION) INCLUDING STAFF, BOARD MEMBERS SERVE ON BOARDS, COUNCILS OR COMMITTEES OF THE OTHER ORGANIZATION?

7. JOINT PROGRAMS (COALITION):

WITHIN THE LAST THREE YEARS HAS YOUR ORGANIZATION WORKED JOINTLY IN PLANNING AND IMPLEMENTING ANY SPECIFIC PROGRAMS OR ACTIVITIES WITH (CONTACT ORGANIZATION)?

8. WRITTEN AGREEMENTS:

DOES YOUR ORGANIZATION HAVE ANY WRITTEN AGREEMENTS WITH (CONTACT ORGANIZATION) PERTAINING TO PERSONNEL COMMITMENTS, CLIENT REFERRALS, PROCEDURES FOR WORKING TOGETHER OR OTHER JOINT ACTIVITIES?

IMPORTANCE OF HIERARCHICAL LEVEL

1. MANY STUDIES ARE DONE AT ONLY ONE HIERARCHICAL LEVEL SUCH AS THE LOCAL COMMUNITY.

2. SOME RESEARCH ON VARIABLES SUCH AS SIZE AND GOAL-DISPLACEMENT INCORPORATE DATA FROM TWO OR MORE HIERARCHICAL LEVELS BUT DO NOT ASSESS THE INFLUENCE OF DIFFERING HIERARCHICAL LEVELS.

3. STRUCTURAL VARIATIONS BETWEEN LEVELS IN AN ORGANIZATION MAY RESULT IN DIFFERENTIAL ACCESSIBILITY TO RESOURCES AS WELL AS DIFFERING GOALS AND NORMS.

SAMPLE

- - 35 HEALTH-RELATED ORGANIZATIONS AT STATE, DISTRICT, AND COUNTY HIERARCHICAL LEVELS
- - DATA COLLECTED IN 1969 IN NONMETROPOLITAN STATE.
- - RESPONDENTS WERE "TOP" PAID ADMINISTRATORS.
- - 156 ORGANIZATIONAL UNITS INTERVIEWED ABOUT INTERACTION WITH 18 CONTACT ORGANIZATIONS.
- - TOTAL ADMINISTRATIONS WERE 2808 (156 x 18).
- - USABLE ADMINISTRATIONS WERE 2700.

CONTACT AND INTERVIEWED ORGANIZATIONS

American Cancer Society

Community Healty Service

Dental Association

Department of Social Services

Division of Rehabilitation Education and Services

Easter Seal Society

Farm Bureau

Health Planning Council

Heart Association

Hospital Association

Medical Society

National Farmer's Organization

Nurses Association

Society of Osteopathic Physicians and Surgeons

Pharmaceutical Association

Tuberculosis and Respiratory Disease Association

United Cerebral Palsy

University Extension Service

OTHER ORGANIZATIONS INTERVIEWED

Associated Health Organizations

Association for Health, Physical Education and Recreation

Association for Mental Health

Association for Retarded Children

Blue Cross

Blue Shield

Comprehensive Health Planning

Congress of Parents and Teachers

Department of Public Instruction

Division of Aging and Chronic Illness

Education Association

Health Council

Interagency Council on Smoking and Health

Nursing Home Association

Regional Medical Program

School Board Association

State Department of Health

ORGANIZATIONAL UNITS

	VOLUNTEER	STATE	DISTRICT	COUNTY	TOTAL
1.	Cancer Society	1	4	6	11
2.	Cerebral Palsy	1	1	0	2
3.	Easter Seal Society	1	0	8	9
4.	Heart Association	1	2	8	11
5.	T.B. Association	1	2	8	11
6.	Blue Cross	1	0	0	1
7.	Blue Shield	1	0	0	1
8.	Congress of Parents & Teachers	1	0	0	1
9.	Mental Health Association	1	0	0	1
10.	Retarded Children Association	1	0	0	1
	PUBLIC				
11.	Community Health Service	1	4	9	14
12.	Division of Rehabilitation, Education and Services	1	4	0	5
13.	Social Services	1	2	8	11
14.	University Extension	1	2	7	10
15.	Aging & Chronic Illness	1	0	0	1
16.	Comprehensive Health Planning	1	0	0	1
17.	Health Department	1	0	0	1
18.	Public Instruction	1	0	0	1

	PROFESSIONAL	STATE	DISTRICT	COUNTY	TOTAL
19.	Dental Association	1	3	0	4
20.	Farm Bureau	2	5	8	15
21.	Hospital Association	1	0	8	9
22.	Medical Society	1	3	7	11
23.	Nurses Association	1	3	0	4
24.	Osteopathic Society	1	3	0	4
25.	Pharmaceutical Association	1	3	0	4
26.	Education Association	1	0	0	1
27.	National Farmers Association	1	0	0	1
28.	Nursing Home Association	1	0	0	1
29.	School Board Association	1	0	0	1
	INTERORGANIZATIONAL				
30.	Health Planning Council	1	2	0	3
31.	Associated Health Organizations	1	0	0	1
32.	Association for Health, Physical Education & Recreation	1	0	0	1
33.	Health Council	1	0	0	1
34.	Interagency Council on Smoking & Health	1	0	0	1
35.	Regional Medical Program	1	0	0	1

EVALUATION CRITERIA

1. COMPARISON OF THE THREE HIERARCHICAL LEVELS OF STATE, DISTRICT, AND COUNTY ON THE THEORETICAL IOR ORDERING OF ITEMS.

2. DETERMINATION OF THE BEST EMPIRICAL ORDERING FOR EACH HIERARCHICAL LEVEL AND COMPARISON OF ANY DIFFERENCES BETWEEN EACH EMPIRICAL ORDERING TO THE ORIGINAL THEORETICAL IOR ORDERING.

3. COMPARISON OF SIMILARITIES AND DIFFERENCES AMONG THE BEST EMPIRICAL ORDERINGS FOR EACH HIERARCHICAL LEVEL.

SCALE ITEMS	PERCENT OF "YES" RESPONSES STATE % OF 631	 DISTRICT % OF 771	 COUNTY % OF 1298
1. DIRECTOR AWARENESS	87.0	53.7	58.2
2. DIRECTOR ACQUAINTANCE	50.7	16.2	24.3
3. DIRECTOR INTERACTION	38.5	8.7	11.4
4. INFORMATION EXCHANGE	46.8	8.3	10.8
5. RESOURCE EXCHANGE	31.1	7.8	11.7
6. OVERLAPPING BOARDS	18.2	4.7	8.8
7. JOINT PROGRAMS	36.6	9.5	10.6
8. WRITTEN AGREEMENTS	5.1	1.0	0.7

"PERFECT" SCALE TYPES

Patterns	State % of 631	District % of 771	County % of 1298	Total % of 2700
1. YYYYYYYY	1.3	0.0	.1	.3
2. YYYYYYYN	6.0	.8	.4	1.8
3. YYYYYYNN	2.1	.3	.3	.7
4. YYYYYNNN	1.7	.3	.5	.7
5. YYYYNNNN	5.1	1.0	.8	1.9
6. YYYNNNNN	3.0	1.9	1.8	2.1
7. YYNNNNNN	3.0	4.5	7.7	5.7
8. YNNNNNNN	23.1	28.4	24.7	25.4
9. NNNNNNNN	13.0	46.3	41.8	36.3
	58.3	83.5	78.1	75.0

COMPARISON OF THEORETICAL AND EMPIRICAL ORDERING

COMPARISON STATISTICS	THEORETICAL ORDERING			EMPIRICAL ORDERING		
	STATE	DISTRICT	COUNTY	STATE	DISTRICT	COUNTY
A. COEFFICIENT OF REPRODUCIBILITY	.8752	.9491	.9312	.8966	.9501	.9347
B. MINIMUM MARGINAL REPRODUCIBILITY	.7019	.8719	.8499	.7019	.8719	.8499
C. PERCENT IMPROVEMENT	.1733	.0772	.0814	.1947	.0781	.0848
D. COEFFICIENT OF SCALABILITY	.5814	.6025	.5420	.6532	.6101	.5651

COMPARISON OF DIFFERENCES BETWEEN THEORETICAL AND EMPIRICAL ORDERINGS

ORDERINGS COMPARED	STATISTICS
1. THEORETICAL - STATE*	
DISTRICT - COUNTY	.89+
2. THEORETICAL - STATE	.90++
3. THEORETICAL - DISTRICT	.76
4. THEORETICAL - COUNTY	.90
5. STATE - DISTRICT	.90
6. STATE - COUNTY	.83
7. DISTRICT - COUNTY	.79

* STATE, DISTRICT, AND COUNTY REFER TO THE EMPIRICAL ORDERINGS FOR EACH LEVEL.

\+ DIFFERENCES AMONG FOUR RANKINGS MEASURED BY KENDALL'S COEFFICIENT OF CONCORDANCE (SIEGEL, 1956) AND TESTED BY CHI-SQUARE ANALYSIS. CALCULATED X^2 = 21.36. TABULAR X^2, 3 DF, .05 = 7.82.

++ DIFFERENCES IN ORDERINGS 2 - 7 TESTED BY SPEARMAN'S RANK ORDER CORRELATION COEFFICIENT (SIEGEL, 1956). TABULAR R_S, 8 DF, .05 = .643.

THEORETICAL AND EMPIRICAL ITEM ORDERING

THEORETICAL ORDERING	EMPIRICAL ORDERING		
	STATE	DISTRICT	COUNTY
1. DIRECTOR AWARENESS	DIRECTOR AWARENESS	DIRECTOR AWARENESS	DIRECTOR AWARENESS
2. DIRECTOR ACQUAINTANCE	DIRECTOR ACQUAINTANCE	DIRECTOR ACQUAINTANCE	DIRECTOR ACQUAINTANCE
3. DIRECTOR INTERACTION	INFORMATION EXCHANGE	JOINT PROGRAMS	RESOURCE EXCHANGE
4. INFORMATION EXCHANGE	DIRECTOR INTERACTION	DIRECTOR INTERACTION	DIRECTOR INTERACTION
5. RESOURCE EXCHANGE	JOINT PROGRAMS	INFORMATION EXCHANGE	INFORMATION EXCHANGE
6. OVERLAPPING BOARDS	RESOURCE EXCHANGE	RESOURCE EXCHANGE	JOINT PROGRAMS
7. JOINT PROGRAMS	OVERLAPPING BOARDS	OVERLAPPING BOARDS	OVERLAPPING BOARDS
8. WRITTEN AGREEMENTS	WRITTEN AGREEMENTS	WRITTEN AGREEMENTS	WRITTEN AGREEMENTS

ORIGINAL AND FIRST ALTERNATIVE THEORETICAL ORDERING *

ORIGINAL THEORETICAL ORDERING	FIRST ALTERNATIVE THEORETICAL ORDERING
1. Director Awareness	Director Awareness
2. Director Acquaintance	Director Acquaintance
3. Director Interaction	Information Exchange
4. Information Exchange	Director Interaction
5. Resource Exchange	Joint Programs
6. Overlapping Boards	Resource Exchange
7. Joint Programs	Overlapping Boards
8. Written Agreements	Written Agreements

* First alternative theoretical ordering based on empirical ordering for state level.

ORIGINAL AND SECOND ALTERNATIVE THEORETICAL ORDERING *

ORIGINAL THEORETICAL ORDERING	SECOND ALTERNATIVE THEORETICAL ORDERING
1. Director Awareness	Director Awareness
2. Director Acquaintance	Director Acquaintance
3. Director Interaction	Joint Programs
4. Information Exchange	Director Interaction
5. Resource Exchange	Information Exchange
6. Overlapping Boards	Resource Exchange
7. Joint Programs	Overlapping Boards
8. Written Agreements	Written Agreements

* Second alternative theoretical ordering based on empirical ordering for district level.

ORIGINAL AND THIRD ALTERNATIVE THEORETICAL ORDERING *

ORIGINAL THEORETICAL ORDERING	THIRD ALTERNATIVE THEORETICAL ORDERING
1. Director Awareness	Director Awareness
2. Director Acquaintance	Director Acquaintance
3. Director Interaction	Resource Exchange
4. Information Exchange	Director Interaction
5. Resource Exchange	Information Exchange
6. Overlapping Boards	Joint Programs
7. Joint Programs	Overlapping Boards
8. Written Agreements	Written Agreements

* Third alternative theoretical ordering based on empirical ordering for county level.

COMPARISON OF ORIGINAL AND ALTERNATIVE THEORETICAL ORDERINGS

COMPARISON STATISTICS	ORIGINAL THEORETICAL ORDERING			FIRST ALTERNATIVE THEORETICAL ORDERING			SECOND ALTERNATIVE THEORETICAL ORDERING		
	State	District	County	State	District	County	State	District	County
A. Coefficient of reproducibility	.8752	.9491	.9312	.8966	.9471	.9364	.8780	.9501	.9
B. Minimum marginal reproducibility	.7019	.8719	.8499	.7019	.8719	.8499	.7019	.8719	.8
C. Percent improvement	.1733	.0772	.0814	.1947	.0752	.0866	.1761	.0781	.0
D. Coefficient of scalability	.5814	.6025	.5420	.6532	.5873	.5767	.5907	.6101	.5

COMPARISON OF ORIGINAL AND ALTERNATIVE THEORETICAL ORDERINGS

	ORIGINAL THEORETICAL ORDERING			FIRST ALTERNATIVE THEORETICAL ORDERING			SECOND ALTERNATIVE THEORETICAL ORDERING			THIRD ALTERNATIVE THEORETICAL ORDERING		
	STATE	DISTRICT	COUNTY	STATE	DISTRICT	COUNTY	STATE	DISTRICT	COUNTY	STATE	DISTRICT	COUNTY
T OF ILITY	.8752	.9491	.9312	.8966	.9471	.9364	.8780	.9501	.9318	.8669	.9481	.9347
RGINAL ILITY	.7019	.8719	.8499	.7019	.8719	.8499	.7019	.8719	.8499	.7019	.8719	.8499
PROVE-	.1733	.0772	.0814	.1947	.0752	.0866	.1761	.0781	.0820	.1650	.0762	.0848
T OF Y	.5814	.6025	.5420	.6532	.5873	.5767	.5907	.6101	.5459	.5535	.5949	.5651

FINDINGS

1. Using the criterion of coefficient of reproducibility (.9 minimum), the valid scales were:

   (1) Theoretical ordering - district and county levels

   (2) Empirical ordering - district and county levels

   (3) All alternative theoretical orderings - district and county levels

2. Using the criterion of coefficient of scalability (.6 minimum), the valid scales were:

   (1) Theoretical ordering - district level

   (2) Empirical ordering - state and district levels

   (3) First alternative theoretical ordering - state level

   (4) Second alternative theoretical ordering - district level

CONCLUSION

GENERAL: THERE IS LIMITED GENERALIZABILITY OF IOR MEASURES ACROSS ORGANIZATIONAL HIERARCHICAL LEVELS.

SPECIFIC: DATA SUGGESTS FUTURE ANALYSIS MIGHT:

(1) UTILIZE EMPIRICAL MODELS TO MEASURE IOR

(2) PURSUE ALTERNATIVE EMPIRICAL ARENAS TO MEASURE THE INFLUENCE OF HIERARCHICAL LEVEL

IMPLICATIONS

1. THEORY REFORMULATION TO ALLOW FOR MODERATING EFFECTS OF HIERARCHICAL LEVEL ON IOR

2. ALTERNATIVE MEASUREMENT MODELS FOR DIFFERING ORGANIZATIONAL LEVELS

3. KNOWLEDGE OF FORMS OF IOR INDICATIVE OF MORE OR LESS INTENSE ORGANIZATIONAL INTERACTION AS A BASIS FOR PLANNING FOR INTER-ORGANIZATIONAL RELATIONS